



NOTES PANCREATITIS

GENERALLY, WHAT IS IT?

PATHOLOGY & CAUSES

- Inflammation of pancreas

TYPES

- Acute, chronic

CAUSES

- Acute
 - Gallstones, alcoholism, direct trauma, infections (mumps)
- Chronic
 - Recurrent acute pancreatitis, chronic alcoholism, cystic fibrosis

RISK FACTORS

- Smoking

SIGNS & SYMPTOMS

- Upper abdominal pain radiating to back; nausea; vomiting

DIAGNOSIS

DIAGNOSTIC IMAGING

- Abdominal CT scan; ultrasound

LAB RESULTS

- Clinical, lab findings; see individual disorders

TREATMENT

OTHER INTERVENTIONS

- Dietary modifications, symptomatic treatment

PANCREATIC PSEUDOCYST

osms.it/pancreatic-pseudocyst

PATHOLOGY & CAUSES

- Localized fluid collection of pancreatic enzymes, necrotic debris and blood encapsulated by non-epithelialized wall (hence the name pseudocyst) composed of fibrous and granulation tissue
- Usually take up to 4–6 weeks to develop, unlike acute fluid collections
- Occurs due to disruption of pancreatic duct → accumulation of pancreatic fluid →

hemorrhagic fat necrosis → inflammatory reaction → encapsulation of fluid by fibrous and granulation tissue

CAUSES

- Arises as complication of acute/chronic pancreatitis/abdominal trauma

COMPLICATIONS

- Infection; hemorrhage
- Compression of the gastrointestinal/urinary/

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biliary tract

- Rupture → spilling of enzymes and debris into abdominal cavity → **diffuse peritonitis**

SIGNS & SYMPTOMS

- Abdominal discomfort, indigestion, anorexia, abdominal mass

DIAGNOSIS

DIAGNOSTIC IMAGING

CT scan

- Large cyst cavity of low attenuation surrounded by **well-defined enhancing wall** within, around pancreas
- Calcifications
- If present, complications may be visualized

Ultrasound

- Visualization of hypoechoic/anechoic cystic fluid collections

MRI

- Not necessary, but useful for distinguishing from organized necrosis

LAB RESULTS

Cyst fluid analysis

- To distinguish from tumor
 - ↓ carcinoembryonic antigen (CEA)
 - ↑ amylase
 - ↓ fluid viscosity

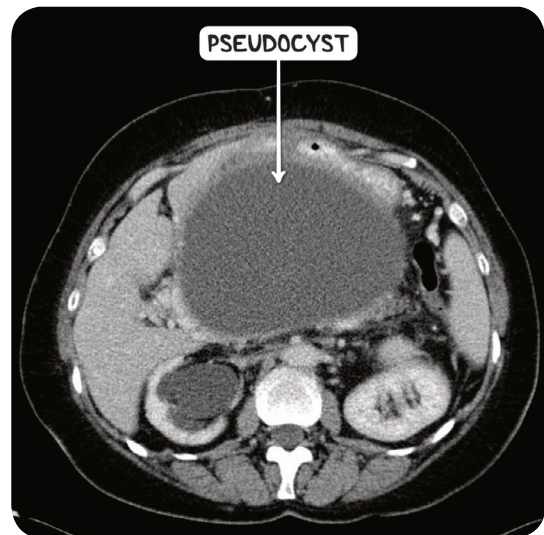


Figure 40.1 A CT scan in the axial plane demonstrating a pancreatic pseudocyst.

TREATMENT

- Initially
 - Bowel rest, total parenteral nutrition (TPN), observation

SURGERY

- If symptoms do not improve
 - Surgical drainage to establish connection which drains pseudocystic fluid into small intestine (cystojejunostomy), stomach (cystogastrostomy), or duodenum (cystoduodenostomy)
- Endoscopic drainage

PANCREATITIS (ACUTE)

osms.it/acute-pancreatitis

PATHOLOGY & CAUSES

- Sudden inflammation of pancreas due to autodigestion → reversible pancreatic injury.

TYPES

Mild

- Inflammation, parenchymal edema, peripancreatic fat necrosis

Severe

- Parenchymal necrosis, hemorrhage

CAUSES

- See mnemonic for summary of causes



MNEMONIC: I GET SMASHED

Causes of Acute pancreatitis

Idiopathic

Gallstones

Ethanol abuse

Trauma

Steroids

Mumps infection

Alcohol abuse

Scorpion sting

Hypertriglyceridemia,
hypercalcemia

Endoscopic retrograde
cholangiopancreatography

Drugs: sulfa drugs, reverse-
transcriptase inhibitors,
protease inhibitors

Alcohol

- Increases zymogen secretion; decreases fluid, bicarbonate production → pancreatic juices become thick, viscous → pancreatic duct blocked
- Stimulates release of inflammatory cytokines
- Oxidative metabolism produces free radicals

Gallstones

- Lodge at Oddi sphincter → pancreatic duct blocked

Alcohol and gallstones

- Pancreatic duct blocked → pancreatic juices back up → pressure increases → zymogen granules fuse with lysosomes → trypsinogen transforms into activated trypsin → digestive enzyme activation, autodigestion

RISK FACTORS

- Biologically male to biologically female, 1:3
- Smoking

COMPLICATIONS

- Most often
 - Acute pseudocyst, intra-abdominal infection, pancreatic abscess, disseminated intravascular coagulation (DIC), internal pancreatic fistula
- Severe manifestations
 - Acute respiratory distress syndrome (ARDS), acute renal failure, hemorrhage, hypotensive shock

SIGNS & SYMPTOMS

- Abdominal pain; loss of appetite; palpable, tender mass
- Cullen's sign
 - Periumbilical region bruising
- Grey Turner's sign
 - Bruising along flank



Figure 40.2 Cullen's sign. Individual presented with a four-day history of abdominal pain following an alcohol binge.

DIAGNOSIS

DIAGNOSTIC IMAGING

CT scan

- Visualization of inflammation, necrosis, abscess, pancreatic pseudocysts

Ultrasound

- Gallstones

LAB RESULTS

- Elevated serum amylase, lipase, bilirubin

OTHER DIAGNOSTICS

Histology

- Microvascular edema; fat tissue necrosis; acute inflammation; destruction of parenchyma, blood vessels; interstitial hemorrhage

TREATMENT

MEDICATIONS

- Pain management, hydration, electrolytes
- Hyperbaric oxygen therapy, antibiotics

SURGERY

- Necrosectomy

OTHER INTERVENTIONS

- Total restriction of food intake, alcohol cessation
- Endoscopic retrograde cholangiopancreatography (ERCP)

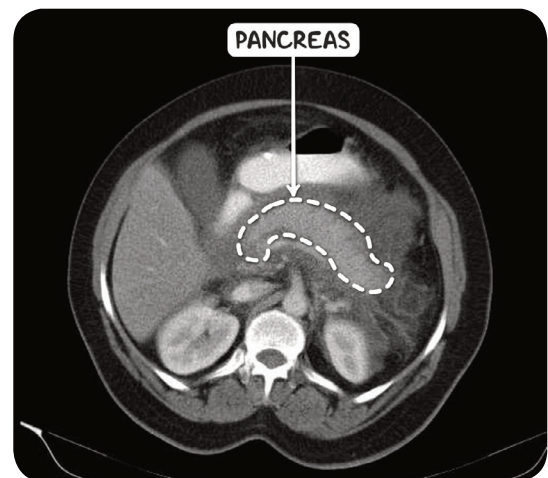


Figure 40.3 A CT scan in the axial plane demonstrating acute pancreatitis. There is diffuse enlargement of the pancreas associated with peripancreatic fluid.

PANCREATITIS (CHRONIC)

osms.it/chronic-pancreatitis

PATHOLOGY & CAUSES

- Persistent, **chronic inflammation** of pancreas due to **autodigestion** → irreversible injury of exocrine, endocrine pancreas
- Fibrosis, calcification
 - Prolonged inflammation produces fibrogenic cytokines, transforming growth factor beta (TGF-beta), platelet-derived growth factor (PDGF) → activates myofibroblasts → collagen production, fibrosis
 - Early stages:** Langerhans islets not affected
 - Advanced:** atrophy, fibrosis of islets

CAUSES

- See mnemonic for summary of causes
- Genetic
 - Hereditary chronic pancreatitis:** autosomal-dominant disease due to mutations in cationic trypsinogen gene
 - Cystic fibrosis:** cystic fibrosis transmembrane conductance regulator (CFTR) mutation → decreased bicarbonate secretion → pancreatic duct plugged, obstructed
- Autoimmune
 - Distinct form of chronic pancreatitis → manifestation of immunoglobulin G (IgG) related disease

COMPLICATIONS

- Pancreatic pseudocyst;** ascites; pancreatic insufficiency; diabetes mellitus; vitamins A, D, E, K deficiency; pancreatic cancer



MNEMONIC: TIGAR-O

Causes of Chronic pancreatitis

Toxins: chronic alcoholism

Idiopathic

Genetic

Autoimmune

Recurrent acute pancreatitis

Obstuction: gallstones, pancreatic head tumor

SIGNS & SYMPTOMS

- Severe abdominal pain radiates to back; nausea; vomiting; steatorrhea; weight loss; edema due to malabsorption

DIAGNOSIS

DIAGNOSTIC IMAGING

CT scan

- Visualization of pancreatic ducts dilatation, calcifications, atrophy, pseudocysts

Ultrasound

- Hyperechogenicity (fibrosis), pseudocysts, pseudoaneurysms, ascites

ERCP/magnetic resonance cholangiopancreatography (MRCP)

- Visualization of pancreatic ducts; chain-of-lakes pattern due to alternating stenosis, dilation

LAB RESULTS

- Mildly elevated** serum amylase, alkaline phosphatase, bilirubin

OTHER DIAGNOSTICS

Histology

- Dilatation of pancreatic ducts; acinar cell atrophy; fibrosis; chronic inflammatory infiltrate; protein plugs, calcifications

TREATMENT

MEDICATIONS

- Pain management
- Pancreatic enzyme replacement

SURGERY

Endoscopy, surgery

- Resectional/drainage procedures for pseudocyst, fistula, ascites

OTHER INTERVENTIONS

- Alcohol cessation, dietary modifications (low-fat)

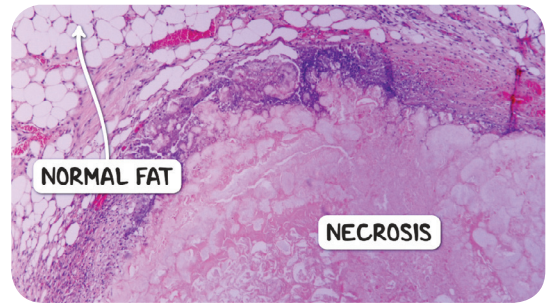


Figure 40.4 The histological appearance of pancreatic fat necrosis in a case of severe pancreatitis.